



COMPUTED TOMOGRAPHY SYSTEM FACILITY

Purpose:

To accurately detect and measure flaws in metallic and composite components including cracks, voids, porosity, and other defects.

MSFC's computed tomography (CT) system produces cross-sectional images of test components. These components can be base material (pre-manufactured) or finished test or flight hardware. The CT system includes two x-ray sources (420 KeV tube and 2 MeV linear accelerator), solid state detectors, a test article movement gantry, and computers that control the system and produce images and allow for user interpretation and analysis.

The CT system generates cross-sections from reconstruction of x-rays that are directed through test components from multiple angles. The resulting images contain a dimensionally accurate depiction of the configuration of the test component at the elevation scanned. By running multiple CT scans at adjacent elevations, the component can be completely characterized and defects detected throughout the component. Both composite and metallic components can be inspected, with flaw detection capability on the order of 1-2 mm flaw diameter with 0.2% contrast sensitivity (0.2% density change).

The Center's CT system is one of the few systems in the United States that was constructed with variable source and detector spacing settings. This allows for optimized inspection of a wide variety of component sizes, from a

minimum diameter of one inch to a maximum diameter of 50" with maximum height of 60" and maximum weight of 3700 pounds. The Center also uses software that can combine adjacent



CT slices into a three-dimensional data model of the inspected component, which can then be viewed from angles other than the original data collection angle. This can improve understanding of the location, geometry, and possible effects of detected defects. The Space Station, Space Shuttle, SRB, RSRM, External Tank, RLV, Technology Transfer, ASTP, SLI, and others are programs that this facility supports.

The CT system is located in Building 4707. The gantry is approximately 15' high by 15' wide by 20' long.

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